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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
GUIDO-JAN SCHMITZ, ET AL. : EXAMINER: JACOBSON, M. L.
SERIAL NO: 10/588,487 :
FILED: AUGUST 4, 2006 : GROUP ART UNIT: 1794
FOR: MULTI-LAYER COMPOSITE :
COMPRISING AN EVOH LAYER AND A
PROTECTIVE LAYER

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal of the Final Rejection dated October 23, 2009 of Claims 1-20. A Notice of Appeal, along with a one-month extension of time, was timely filed on February 23, 2010.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Evonik Degussa GmbH, having an address at Rellinghauser Strasse 1-11, 45128 Essen, Germany.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1-20 stand rejected and are herein appealed.

IV. STATUS OF THE AMENDMENTS

An amendment under 37 CFR 1.116 was filed on January 22, 2010. In an Advisory Action dated February 3, 2010, the amendment was entered. The Advisory Action also indicated that the amendment had overcome a rejection under 35 U.S.C. § 112, second paragraph.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A summary of the claimed subject matter on appeal, as claimed in independent Claim 1, is mapped out below, with reference to page and line numbers in the specification added in **[bold]** after each element.

A multilayer composite comprising the following layers: **[page 2, lines 26-27]**

- I. an interior layer I selected from the group consisting of a fluoropolymer molding composition and a polyolefin molding composition; **[page 2, lines 28-31]**
- II. a bonding agent layer II that has the following composition:
 - a) from 0 to 80 parts by weight of a graft copolymer prepared using the following monomers:
 - from 0.5 to 25% by weight, based on the graft copolymer, of a polyamine having at least 4 nitrogen atoms and

- polyamide-forming monomers selected from the group consisting of lactams, ω -aminocarboxylic acids and equimolar combinations of diamine and dicarboxylic acid;
- b) from 0 to 100 parts by weight of polyamide, and
- c) from 0 to 75 parts by weight of a polymer selected from the group consisting of fluoropolymers and polyolefins, **[page 2, line 32 to page 3, line 23]**

with the sum of the parts by weight of a), b) and c) being 100, **[page 3, lines 24-25]**
and, in addition,

- the sum of the components a) and b) comprising at least 20 parts by weight of monomer units based on 100 parts by weight of a), b) and c), derived from caprolactam and/or the combination hexamethylenediamine/adipic acid, hexamethylenediamine/suberic acid, hexamethylenediamine/sebacic acid, hexamethylenediamine/dodecanedioic acid, hexamethylenediamine/isophthalic acid or hexamethylenediamine/terephthalic acid and **[page 3, lines 26-37]**
- d) not more than 50 parts by weight of additives selected from the group consisting of impact-modifying rubber and auxiliaries and additives; **[page 3, line 38 to page 4, line 5]** and

III. a layer III comprising an EVOH molding composition, **[page 4, lines 6-7]**
wherein layer II is between layer I and layer III. **[page 2, lines 17-19]**

VI. GROUNDS OF REJECTION

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over US 2002/0142118 (Schmitz et al) and US 6,355,358 (Böer et al) and US 6,428,866 (Jadamus et al).

VII. ARGUMENT

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Schmitz et al and Böer et al and Jadamus et al. That rejection is untenable and should not be sustained.

The present invention addresses a problem in the art of unsatisfactory adhesion between a layer of ethylene-vinyl alcohol copolymer (EVOH), which acts as a barrier layer in multilayer composites, and a layer based on a fluoropolymer or a polyolefin, which acts as a protective layer which forms a barrier against alcohols, as described in the specification at page 1, line 4 to page 2, line 24. Applicants have successfully addressed this problem with presently-recited bonding agent layer II, as recited in the present claims.

Schmitz et al, which was cited as “A” category prior art in the International Search Report for the corresponding international application, i.e., not particularly relevant, addresses a problem in the adhesion of an EVOH layer to a polyamide layer based on particular polyamides, such as PA11, PA12, PA612, PA1012 and PA1212 with which EVOH is incompatible [0004], without any use of a polyolefin layer as an adhesion promoter [0012]. Schmitz et al achieve secure bonding of such incompatible layers with a layer disclosed therein as layer I [0015]-[0023].

Böer et al is drawn to a problem of insufficient compatibility between polyamides and polyesters and insufficient adhesion between laminate layers obtained therefrom (column 1, line 56ff). The invention of Böer et al is drawn to an adhesion promoter which is a particular graft copolymer (paragraph bridging columns 2 and 3) that enhances the adhesion between,

for example, a polyamide-based layer and a polyester-based layer (column 5, line 66 to column 6, line 4).

Jadamus et al discloses a multilayer plastic composition having (I) an outer layer of a thermoplastic molding composition and (II) an inner layer of an electrically conductive thermoplastic molding composition containing graphite fibrils (column 2, lines 7-13). The outer layer may be, *inter alia*, a polyolefin molding composition and the inner layer may be, *inter alia*, a polyolefin or a fluoropolymer (column 2, lines 20-28).

The Examiner holds that it would have been obvious to include a fluoropolymer or polyolefin interior layer such as those disclosed by Jadamus et al in the multilayer article of Schmitz et al “in order to increase the fuel barrier properties of the laminate” and to have adhered an additional barrier layer to the EVOH layer of Schmitz et al, “which would have produced a laminate comprising the following layers: PA11, PA12, PA612, PA1012 and [sic] or PA1212/adhesive layer/EVOH layer (ethylene content between 25 to 60 mol%)/adhesive layer/fluoropolymer or polyolefin layer,” and that in view of Boer et al, one skilled in the art would have been motivated to include 10-85 parts by weight of the fluoropolymer or polyolefin between the above EVOH layer, and above fluoropolymer or polyolefin layer.

In reply, the combination of Schmitz et al, Böer et al and Jadamus et al neither discloses nor suggests the presently-claimed invention. While there may be similarities between the layer I material of Schmitz et al and the adhesion promoter of Böer et al to the bonding agent layer II of the present claims, none of the applied prior art address the problem of adhering an EVOH-based layer to an olefin-based or fluoropolymer-based layer, and it would be impossible to predict to what extent, if any, the layer I material of Schmitz et al or the adhesion promoter of Böer et al, would have on adhering presently-recited layers I and III. Jadamus et al adds nothing relevant to the issue of predictability of the layer I material of

Schmitz et al or the adhesion promoter of Böer et al as a bonding agent between an EVOH-based layer and an olefin-based or fluoropolymer-based layer.

In response to Applicants' arguments that none of the applied prior art address the problem of adhering an EVOH-based layer to an olefin-based or fluoropolymer-based layer, the Examiner finds in the Final Rejection that Schmitz et al and Böer et al disclose an "adhesive composition comprising the **same components**" (emphasis by Applicants) as recited in the present claims, and that Böer et al "teaches the blending of adhesive compositions with an amount of the polymer they are intended to adhere to in order [to] increase the adhesion between the adhesive composition and the polymer layer."

In reply, the adhesive compositions of Schmitz et al and Böer et al differ from that of presently-recited bonding agent layer II. Neither contains a fluoropolymer or a polyolefin. While various claims such as present Claim 1 do not require that bonding agent layer II include a fluoropolymer or a polyolefin, the Examiner's rationale requires a teaching in the art that the adhesive composition contain some amount of the polymer to which it is intended to adhere. The Examiner relies on Böer et al's disclosure that "[a] typical approach to bonding, for example polyester and polyamide layers, would be to use an adhesion promoter consisting of a mixture of polyamide and polyester" (column 2, lines 7-9). But the Examiner ignores the disclosure immediately following, which describes the problems of such an approach (column 2, lines 10-16). Thus, the prior art neither discloses nor suggests that the embodiment of present bonding agent layer II when component c) is not present would bond a fluoropolymer or a polyolefin to EVOH. Nor does the prior art disclose or suggest the present bonding agent layer II when component c) is present, since no adhesive is disclosed that contains a fluoropolymer or a polyolefin. As stated above, the applied prior art provides no solution or suggestion for adhering an EVOH-based layer to an olefin-based or fluoropolymer-based layer.

In response to Applicants' arguments that it would be impossible to predict to what extent, if any, the layer I material of Schmitz et al or the adhesion promoter of Böer et al, would have on adhering presently-recited layers I and III, and that Jadamus et al adds nothing relevant to the issue of predictability of the layer I material of Schmitz et al or the adhesion promoter of Böer et al as a bonding agent between an EVOH-based layer and an olefin-based or fluoropolymer-based layer, the Examiner finds in the Final Rejection that Applicants have not presented reasoning or evidence to support this assertion.

In reply, Applicants have provided such reasoning. Nevertheless, the burden is on the Examiner to make out a *prima facie* case of obviousness. Such a *prima facie* case has not been made out. Thus, Applicants were under no burden to provide any evidence of what would be predictable.

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

VIII. CONCLUSION

For the above reasons, it is respectfully requested that the rejection be REVERSED.

Respectfully submitted,

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CLAIMS APPENDIX

Claim 1. A multilayer composite comprising the following layers:

- I. an interior layer I selected from the group consisting of a fluoropolymer molding composition and a polyolefin molding composition;
- II. a bonding agent layer II that has the following composition:
 - a) from 0 to 80 parts by weight of a graft copolymer prepared using the following monomers:
 - from 0.5 to 25% by weight, based on the graft copolymer, of a polyamine having at least 4 nitrogen atoms and
 - polyamide-forming monomers selected from the group consisting of lactams, ω -aminocarboxylic acids and equimolar combinations of diamine and dicarboxylic acid;
 - b) from 0 to 100 parts by weight of polyamide, and
 - c) from 0 to 75 parts by weight of a polymer selected from the group consisting of fluoropolymers and polyolefins,with the sum of the parts by weight of a), b) and c) being 100,
and, in addition,
 - the sum of the components a) and b) comprising at least 20 parts by weight of monomer units based on 100 parts by weight of a), b) and c), derived from caprolactam and/or the combination hexamethylenediamine/adipic acid, hexamethylenediamine/suberic acid, hexamethylenediamine/sebacic acid, hexamethylenediamine/dodecanedioic acid,

hexamethylenediamine/isophthalic acid or

hexamethylenediamine/terephthalic acid and

- d) not more than 50 parts by weight of additives selected from the group consisting of impact-modifying rubber and auxiliaries and additives;
and

III. a layer III comprising an EVOH molding composition,
wherein layer II is between layer I and layer III.

Claim 2. The multilayer composite as claimed in claim 1, wherein
the component II.a) is present in an amount of from 1 to 60 parts by weight and/or
the component II.b) is present in an amount of from 10 to 75 parts by weight.

Claim 3. The multilayer composite as claimed in claim 1, wherein
the component II.a) is present in an amount of from 3 to 40 parts by weight and/or
the component II.b) is present in an amount of from 25 to 65 parts by weight.

Claim 4. The multilayer composite as claimed in claim 1, wherein from 5 to 75 parts
by weight of the component II.c) are present.

Claim 5. The multilayer composite as claimed in claim 4, wherein from 10 to 65 parts
by weight of the component II.c) are present.

Claim 6. The multilayer composite as claimed in claim 4, wherein from 20 to 55 parts
by weight of the component II.c) are present.

Claim 7. The multilayer composite as claimed in claim 1, wherein interior layer I comprises the fluoropolymer molding composition, which comprises a fluoropolymer selected from the group consisting of PVDF, ETFE, ETFE modified by a third component, ECTFE, PCTFE, THV, FEP and PFA.

Claim 8. The multilayer composite as claimed in claim 1, wherein interior layer I comprises the polyolefin molding composition, which comprises polyethylene or isotactic polypropylene.

Claim 9. The multilayer composite as claimed in claim 1, wherein the fluoropolymer or the polyolefin is adhesion-modified.

Claim 10. The multilayer composite as claimed in claim 1, wherein component II.b. is present and the polyamide of the component II.b. comprises PA6, PA66, PA6/66, PA68, PA610, PA612, a polyamide derived from hexamethylenediamine together with isophthalic acid and/or terephthalic acid or mixtures thereof.

Claim 11. The multilayer composite as claimed in claim 1, further comprising a layer comprising a polyamide molding composition or a polyolefin molding composition and is joined to the layer III by a suitable bonding agent.

Claim 12. The multilayer composite as claimed in claim 1 that is a pipe or a hollow body.

Claim 13. The multilayer composite as claimed in claim 1 that is a pipe corrugated in its entirety or in subregions.

Claim 14. The multilayer composite as claimed in claim 1 that is a fuel line, a brake fluid line, a coolant line, a hydraulic fluid line, a filling station line, an air conditioner line, a vapor line, a container or a filling port.

Claim 15. The multilayer composite as claimed in claim 1, wherein one of the layers of which the composite is composed or an additional interior layer has been made electrically conductive.

Claim 16. The multilayer composite as claimed in claim 1 produced by coextrusion, coating, multicomponent injection molding or coextrusion blow molding.

Claim 17. The multilayer composite as claimed in claim 1, wherein interior layer I comprises the fluoropolymer molding composition.

Claim 18. The multilayer composite as claimed in claim 1, wherein interior layer I comprises the polyolefin molding composition

Claim 19. The multilayer composite as claimed in claim 1, wherein the EVOH of the EVOH molding composition has an ethylene content of 25 to 60 mol%.

Claim 20. The multilayer composite as claimed in claim 1, wherein bonding agent layer II comprises PA6.

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EVIDENCE APPENDIX

None.

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RELATED PROCEEDINGS APPENDIX

None.